

Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

1. (Currently Amended) A system for dispatching of at least one product lot for processing to a plurality of pieces of manufacturing equipment arranged in groups within processing stages of a manufacturing line, said system comprising:

a lot dispatcher in communication with an order entry system to receive requests for fabrication of a product lot, in communication with a process information system to receive procedures defining which pieces of manufacturing equipment are required for said fabrication of said product lot, and in communication with a manufacturing information system to dynamically receive a status of said fabrication of said product lot, a criticality factor for each piece of manufacturing equipment, and a queue level for each piece of manufacturing equipment that follows a current group of pieces of manufacturing equipment required for said product lot; and

a priority factor calculator in communication with said lot dispatcher to receive a listing of said defined pieces of manufacturing equipment required for said fabrication of said product lot, said criticality factor, and said queue level, for determining a priority factor for said product lot such that each group of pieces of manufacturing equipment following said current group of pieces of manufacturing equipment has a balanced loading and said product lot is processed at an expeditious time for on-time delivery.

2. (Original) The system for dispatching of claim 1 wherein:

if groups of first following pieces of manufacturing equipment have a criticality factor of a first level, said priority factor has a first priority level, and

if groups of first following pieces of manufacturing equipment are of a first type
and if groups of second following pieces of manufacturing equipment are of a
second type, said priority factor has a second priority level.

3. (Original) The system for dispatching of claim 2 wherein if a magnitude of said first priority level achieves a threshold level, said product lot is immediately dispatched for processing.

4. (Previously Presented) The system for dispatching of claim 2 wherein if said second priority level achieves a threshold level, said product lot is immediately dispatched for processing.

5. (Original) The system for dispatching of claim 2 wherein:

said priority factor calculator determines said first priority factor level by the formula:

$$\mathbf{KF_1} = \frac{\mathbf{WIP_c}}{\mathbf{TOOL\#_c * PPH_c * EFF_c}}$$

where:

KF_1 is said first priority level for a product lot entering a group of current pieces of manufacturing equipment

WIP_c is a number of items within all product lots in a queue for the group of first following pieces of manufacturing equipment,

TOOL#_c is a number of pieces of equipment within a group of the first following pieces of manufacturing equipment;

PPH_c is an average number of items of product capable of being manufactured by said group of the first following pieces of manufacturing equipment,

EFF_c is an efficiency factor for said group of the first following pieces of manufacturing equipment.

6. (Original) The system for dispatching of claim 2 wherein:

said priority factor calculator determines said second priority level by the formula:

$$\mathbf{KF_2} = \frac{\mathbf{WIP_cd} + \mathbf{INPR_cd} + \mathbf{WIP_d}}{\mathbf{TOOL\#_d} * \mathbf{PPH_d} * \mathbf{EFF_d}}$$

where:

KF_2 is said second priority level for a product lot entering a current group of pieces of manufacturing equipment

WIP_cd is a number of items within all product lots in queue for the group of first following pieces of manufacturing equipment and the group of second following pieces of manufacturing equipment,

INPR_cd is a number of items within all product lots in queue for the group of first following pieces of manufacturing equipment which are to proceed subsequently to the group of second following pieces of manufacturing equipment,

WIP_d is a number of items within all product lots in queue for the group of second following pieces of manufacturing equipment,

TOOL#_d is number of pieces of equipment within a group of the second following pieces of manufacturing equipment;

PPH_d is an average number of items of product capable of being manufactured by said group of the second following pieces of manufacturing equipment,

EFF_d is an efficiency factor for said group of the second following pieces of manufacturing equipment.

7. (Original) The system for dispatching of claim 2 wherein if the group of first following pieces of manufacturing equipment has a criticality factor of a second level, said priority factor has a third priority level.

8. (Previously Presented) The system for dispatching of claim 7 wherein if said third priority level indicates that said product lot should not be immediately dispatched for processing, said product lot is placed on a queue of one of the first following pieces of manufacturing equipment.

9. (Original) The system for dispatching of claim 2 wherein if the group of first following pieces of manufacturing equipment is not of the first type, said priority factor has a fourth priority level.

10. (Original) The system for dispatching of claim 9 wherein if said fourth priority level indicates that said product lot should not be immediately dispatched for processing, said product lot is placed on one queue of one of the first following pieces of manufacturing equipment.

11. (Original) The system for dispatching of claim 2 wherein if the group of second following pieces of manufacturing equipment is not of the second type, said priority factor has a fifth priority level.

12. (Previously Presented) The system for dispatching of claim 11 wherein if said fifth priority level indicates that said product lot should not be immediately dispatched for

processing, said product lot is placed on a queue of one of the first following pieces of manufacturing equipment.

13. (Original) The system for dispatching of claim 2 wherein if the group of first following pieces of manufacturing equipment is of the first type, and the group of second following pieces of manufacturing equipment is of the second type, and the group of second following pieces of manufacturing equipment has a criticality factor that is not the first level, said priority factor has a sixth priority level.

14. (Previously Presented) The system for dispatching of claim 13 wherein if said sixth priority level indicates that said product lot should not be immediately dispatched for processing, said product lot is placed on a queue of one of the first following pieces of manufacturing equipment.

15. (Previously Presented) The system for dispatching of claim 1 wherein said product lot is substrates onto which integrated circuits are fabricated.

16. (Original) The system for dispatching of claim 1 wherein said manufacturing equipment is integrated circuit processing equipment for the formation of integrated circuits upon substrates.

17. (Previously Presented) The system for dispatching of claim 16 wherein the integrated circuit processing equipment includes furnaces and substrate cleaning equipment.

18-85 Cancelled)

86. (Currently Amended) A method of selecting a selected product lot to be processed in a first piece of manufacturing equipment from a plurality of product lots ready for processing in the first piece of manufacturing equipment, the method comprising:

for each product lot in the plurality of product lots ready for processing, calculating a ranking factor for the product lot, the calculating comprising:

determining a first magnitude of processing to be done;

determining a second magnitude of production capacity; and

computing the ranking factor as a ratio of the first magnitude to the second magnitude;

determining a highest priority ranking factor; and

designating a product lot of the plurality of product lots with the highest priority ranking factor as the selected product lot.

87. (Currently Amended) The method of claim 86 wherein the calculating further comprises identifying a second piece of manufacturing equipment that will process the product lot subsequent to processing of the product lot by the first piece of manufacturing equipment.

88. (Previously Presented) The method of claim 87 wherein the first magnitude is a count of product lots ready for processing in the second piece of manufacturing equipment.

89. (Previously Presented) The method of claim 87 wherein the second magnitude is a function of:

a count of machines of a type of the second piece of manufacturing equipment;

an average number of product lots that a machine of the type of the second piece of manufacturing equipment is capable of processing; and

an efficiency factor for the second piece of manufacturing equipment.

90. (Previously Presented) The method of claim 87 wherein one or more product lots ready for processing in the second piece of manufacturing equipment will be subsequently processed by a third piece of manufacturing equipment and the first magnitude is a sum of:

a count of product lots ready for processing in the second piece of manufacturing equipment that will be subsequently processed by the third piece of manufacturing equipment;

a count of product lots in processing by the second piece of manufacturing equipment that will be subsequently processed by the third piece of manufacturing equipment;

a count of product lots ready for processing in the third piece of manufacturing equipment.

91. (Previously Presented) The method of claim 87 wherein one or more product lots ready for processing in the second piece of manufacturing equipment will be subsequently processed by a third piece of manufacturing equipment, and the second magnitude is a function of:

a count of machines of a type of the third piece of manufacturing equipment;

an average number of product lots that a machine of the type of the third piece of manufacturing equipment is capable of processing; and

an efficiency factor for the third piece of manufacturing equipment.

92. (Previously Presented) The method of claim 87 wherein the calculating further comprises:

determining if the second piece of equipment is of a first type; and

if the second piece of equipment is not of the first type, assigning the ranking factor a first priority level.

93. (Previously Presented) The method of claim 92 wherein the first type is critical.

94. (Previously Presented) The method of claim 92 wherein the first priority level is zero.

95. (Previously Presented) The method of claim 87 wherein one or more product lots ready for processing in the second piece of manufacturing equipment will be subsequently processed by a third piece of manufacturing equipment, and the calculating further comprises:

determining if the third piece of equipment is of a second type; and

if the third piece of equipment is not of the second type, assigning the ranking factor a second priority level.

96. (Previously Presented) The method of claim 95 wherein the second type is critical.

97. (Previously Presented) The method of claim 95 wherein the second priority level is zero.

98. (Previously Presented) The method of claim 86 wherein the product lots are substrates for integrated circuits.

99. (Previously Presented) The method of claim 86 wherein the first piece of manufacturing equipment is a piece of integrated circuit processing equipment.

100. (Previously Presented) The method of claim 99 wherein the piece of integrated circuit processing equipment is one out of a group consisting of a furnace and a substrate cleaning machine.

101. (Previously Presented) A method of processing a plurality of lots of semiconductor wafers in a semiconductor fabrication facility having a plurality of semiconductor processing equipment, the method comprising:

for each lot of wafers, receiving a process flow for the lot of wafers and identifying which groups of semiconductor processing equipment can be used for a next step of the process flow;

calculating a ranking factor for the plurality of lots, the calculating comprising determining a first magnitude of processing to be done, determining a second magnitude of production capacity, and computing the ranking factor as a ratio of the first magnitude to the second magnitude;

determining a highest priority ranking factor; and

designating a selected lot of wafers with the highest priority ranking factor to be processed by at least one of the semiconductor processing equipment.